# MODEL MATEMATIK EKSTRAKSI AROMATIK BAHAN BAKAR KEROSIN MENGGUNAKAN SOLVEN DMSO DALAM KOLOM BERISI

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**Th.1999**

## ABSTRAK

Aliphatic solution from fuel is used for metal organic solvent and a medium of uranium extraction that required separation process of aromatic compound contained whithin it. Aromatic separation is conducted by countercurrent extraction. Extraction equipment is a column with rasching ring glass having 0.5 cm of diameter. The flow on solvent dimethylsulfoxid extraction is a continuous flow, while fuel that contain of aromatic is a dispersion one. Mathematical extraction model represented the transfer of aromatic mass by considering the mixture system of dimetylsulfoxid-xylen-kerosene and extraction in the column which is occurred in the steady state. In steady condition, aromatic mass transfer from dispersion flow into continuous flow is influenced by the difference of concentration, convection and axial mixing with mathematical model as follows:

$$\frac{d^2 Cx}{dZr^2} - Pe_c \frac{dCx}{dZr} + \varepsilon\, Sh_c \left[ \left( \frac{Uc}{K\ Ud} - 1 \right) Cx + \frac{1}{K}\ Cyo \right] = 0$$

$$Cyo = Cy_I - \left( \frac{Lc}{Ld} \left( Cx_o - Cx_I \right) \right)$$

Sherwood and Peclet ammount at the scope of observation of $Re_c$ variable around 8 to 14, $Uc/Ud$ around 1.22 to 1.88 and $Z/dp$ around 0 to 160 as follows:

$$Sh_c = 0{,}686\ (Re_c)^{0{,}446} \left[ \frac{Uc}{Ud} \right]^{0{,}380} \left[ \frac{Z}{dp} \right]^{0{,}057}$$

$$Pe_c = 314{,}1\ (Re_c)^{-0{,}409} \left[ \frac{Uc}{Ud} \right]^{-0{,}979} \left[ \frac{Z}{dp} \right]^{0{,}413}$$

The mathematical model of extraction above can be used to arrange extraction equipment and find the aromatic distribution whithin the extraction equipment.